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Monterey, California, Naval Postgraduate School

Computer Center
News Letter
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BITS AND BYTES

1. Busy tones on X2611. We apologize to the increasing number of users of ASCII dial-up terminals for the lack of appropriate lines into the computer. We are sorry, but we cannot expand this service until the School transfers to the new Centrex II phone system. Unfortunately this installation was postponed until December 2, too late to relieve the situation this quarter.

2. VERSATEC Plotter. Want to be ready to go when the new plotter is installed in mid-January? If so, you can start to familiarize yourself with the new Electrostatic Plotting System (EPS) which we have already installed on the IBM 360. For information, please contact Sharon Raney (In-102A, ext. 2672) after 1 January. The Systems Group is writing software support to allow the continued use of our present CALPLOT package, DRAWP, etc.

3. 'The New Computer.' Work proceeds on the many steps toward acquisition of a system to replace our aging IBM 360/67 computer. Primary emphasis at this stage is on the requirements study and attempts to get the necessary financial support firmly established in someone's budget. If you haven't conveyed your ideas or stated your needs to the Planning Committee, please do so as soon as possible. Contact any committee member or the following faculty members: Gerry Brown (Chairman), Norm Schneidewind (Vice-Chairman), or Doug Williams (Secretary).

4. Volunteer Consultants. Are you willing to take some time to help a fellow computer user? It has occurred to us that some of you, skilled and knowledgeable in the capability and foibles of some of the more esoteric packages on the system, may be willing to provide limited consulting help to others. We are thinking particularly of non-mainstream software that we can't support because of staffing limitations, or routines that we don't even know about but which are important to a subset of users. You could give as much or as little time as you can afford. The right word from you may get the user off and running.

The User Services Group will post and maintain a list of helpful people and their special expertise. Please sign up with Roger Hilleary, Manager, User Services (In-133, X2752).

5. Speeding up Communications. Tired, as we are, of communicating at speeds of 110 and 134.5 bps? Well, we are delighted to report that arrangements have been made to provide higher-speed line support via the IBM 3705 Communications Controller which is presently used by DMDC. It supports remote entry job operations under OS/MVT. Our lines on the old IBM 2702 are hard-assigned and cannot be speeded up. The good news is that these new lines will run at 300-2400 baud. The bad news is that it will probably take IBM until April to deliver the hardware.

6. ARPANET, C^3, etc. ARPA is about to provide the School with computer hardware and other support for the proposed laboratory for the Command, Control and Communications (C^3) curriculum. Principal equipment will be a PDP 11/70 system running the UNIX operating system, connected to the ARPANET by a TIP (Terminal Interface Processor).

The TIP, to be installed in April 1978, will allow NPS users terminal access to the unclassified resources available via the ARPANET in major universities and research laboratories. The PDP 11/70 and the display devices will follow in June. It will be housed in a secure area and be used principally by students in the C^3 curriculum. The system is configured as a remote site module of the ACCAT system (Advanced Command & Control Architectural Testbed) at NOSC, San Diego. Additional details will be provided in later newsletters.

POLICY ON SCRATCHING DISK03

We want to reiterate that all data sets on DISK03 will be scratched by us only at the end of each academic quarter. Users should never scratch any other user's data sets without prior authorization from that user.

We want to encourage everyone not to use date protection for data sets on DISK03. Such protection requires operator intervention whenever such a data set is opened for output. This can cause the unattended job queue to be halted, thus wasting hours of CPU time.

IMSL VS. SSP3

Many users who ask about available subroutines seem to be unaware that all the contents of the International Mathematical and Statistical Libraries (IMSL)

are available on both OS/MVT and CP/CMS. In all or almost all cases the routines in this library are far superior to corresponding ones in IBM's Scientific Subroutine Package, Version 3. Complete documentation on IMSL is available in the Consulting Office. We strongly advise that you look first at IMSL routines when you need a standard facility.

IMSL linear algebra routines are contained in the "L" chapter. A total of 38 are available, each in both single and double precision. Main subdivisions are "solutions of linear equations," "matrix inversion" and "rectangular matrix abilities." Another category, "decomposition, substitution and improvement," contains basic modules that are utilized by the other routines. A variety of methods, element storage modes and other options are available. Special routines to convert routines from one storage mode to another are contained in the "V" chapter. The most popular members of the "L" chapter are: LEQT1F (Linear Equations Solution, Full Storage Mode), LINV1F (Inversion of a Matrix, Full Storage Mode), and LLSQAR (Least Squares Solution of Overdetermined System).

FORTRAN ARGUMENT WIPEOUTS

One Fortran problem all too frequently encountered by the Programming Consultant results from the use of constants in the argument lists in CALL statements. For example, the user may write:

```
CALL SUBR (10, A, 3)
```

If he is not completely familiar with SUBR, he may be unaware that it contains code of the following sort:

```
SUBROUTINE SUBR (N, A, IR)
    ...
IR = 0
RETURN
END
```

If such were the case, then the value of the constant "3" in the user's program would be wiped out when SUBR is executed. Subsequent execution of any statement containing a "3", such as

```
I = I + 3
```

would produce erroneous results that are very difficult to diagnose.

Therefore, unless you are totally familiar with the internals of a subroutine, it is much safer to use variable names in calling lists, e.g.

```
...
N=10
IR=3
CALL SUBR (N, A, IR)
...
```

MORE ON DISK SPACE ALLOCATION

Basic information on the allocation of space on disks under the OS/MVT system is provided in 3.6.2.4 of the NPS User's Manual and in Technical Note

0141-05. The following article is reprinted with minor modifications from the CUNY/UCC New York Newsletter. A prior section appeared in the last issue of the Newsletter.

ABENDS. If a job step which is writing a data set executes and goes into secondary allocation, it could terminate abnormally with a B37 system completion code for one of two reasons: either more than 16 extents were needed before the step could complete writing, or the full 15 secondary allocations were insufficient. If there is physically not enough space on the volume before the full number of secondary allocations is used, the ABEND code is either B37 or E37. If only primary space is requested but is insufficient, the ABEND code is D37. In each case, the primary allocation should be increased.

A disk pack which contains a large number of small data sets, like most of the disks at the Computer Center, is likely to look somewhat like Swiss cheese. That is, while a large number of tracks on the particular volume may remain free, the unrecorded space may be divided into a large number of relatively small blocks of contiguous tracks.

The space situation on our public disks is subject to change at any time. Do not expect to find the same amount of space available from day to day. A printout of the available disk space on our disks is usually available in the Consulting Office.

By specifying CONTIG in the SPACE parameter for a new data set, you can request that the primary space be allocated in a single extent. But you must be certain that the largest available extent on the disk will accommodate that primary allocation. Note that CONTIG does not mean that any incremental allocations requested will be contiguous with the primary space nor that each increment will itself be in a single extent. Therefore, CONTIG rarely makes sense in conjunction with incremental allocations.

Although a data set will rarely require the full sixteen extents, this becomes more and more likely as the disk pack becomes more fragmented. Fortunately, you generally need not concern yourself with the extents a data set occupies. The volume itself maintains the information associating each extent with the correct data set and keeps it in a system data set called the Volume Table of Contents, or VTOC.

The VTOC. Each disk pack has a label, analogous to the volume label on magnetic tape, beginning at track 0 on cylinder 0, and containing, among other things, the location of the VTOC. The VTOC can be found anywhere on the volume after this label. The VTOC consists of data set control blocks (DSCBs) which describe and locate all other data sets (plus extents) recorded on that volume, as well as of the location and size of the free extents.

There are seven types of DSCBs which make up the VTOC. For example, the "free space" or format-5 DSCBs keep an account of available extents (one for every 26 free extents). Each data set requires one "identifier" or format-1 DSCB to describe the data set and its first three extents. If

needed, an "extension" or format-3 DSCB describes the fourth through sixteenth extents. Some of the other DSCBs have more specialized purposes, such as the "index" or format-2 DSCB which is required only if the data set is "indexed sequential."

The function of the VTOC is important to understand. When a data set is to be created on a particular volume, the operating system scans the VTOC for the format-1 DSCBs to determine whether a data set of that name already exists on that volume. If not, the operating system then scans the format-5 DSCBs to determine whether there is sufficient free space. In the process of creating the new data set, a format-1 (and, if needed, a format-3) DSCB is added to the VTOC, and the appropriate format-5 DSCB is updated or deleted.

The format-1 or "identifier" DSCB is analogous to the combined header and trailer labels on a standard labeled magnetic tape (disk packs are always "labeled"). It contains the data set's creation and last accessed dates, the data set organization (DSORG, see below), the block length (BLKSIZE), the record format (RECFM), the logical record length (LRECL), and the information necessary to find the actual data in all of its extents. This is why the DCB (data control block) information is unnecessary when reading a previously created data set on a disk pack.

(This article will be concluded in the next Newsletter.)

USER'S MANUAL UPDATES

Recently, update packets for several chapters of the NPS User's Manual have been issued. Presently current updates are:

Update No.	Date	Chapter	Topic
A-3	10/77	1	Background and Hardware
B-2	10/77	2	Overview of Services
C-2	10/77	3	Batch Processing
*D-1	3/77	4	Time-Sharing
*E-1	11/77	5	Language Processors
G-1	11/77	7	Program Libraries
*H-1	9/77	8	Publications

Only the updates marked with "*" have been sent to all registered holders. The other updates represent only minor revisions to earlier updates. However, all update packages dated in 1974 or earlier are now obsolete, except for Chapters 6 and 7.

If you are missing any chapter of the Manual, or have an obsolete edition, copies of the most recent material are available in the Consulting Office, In-146. Please also check in at the Registration and Accounting Office, In-147, so that we can correct our mailing list.

CSMP-III TECHNICAL MEMO

Copies of the new tech memo, Job Control Language for CSMP-III, are available in the Consulting Office, In-146. The Continuous Systems Modeling Program, Version III, is currently available at NPS. It allows the scientist or engineer to simulate complex, dynamic systems using the block-modeling technique.

PLEASE RETURN USER'S MANUAL

Those who are departing from the School in December and who possess copies of the Manual are requested to drop them off at In-147. We don't have a "sign-off" process, but your cooperation can save us considerable expense and trouble.

RECENT ADDITIONS TO THE COMPUTER CENTER LIBRARY

Books

Author	Title
Blaauw, Gerrit	Digital System Implementation
Poliva & Pakin	APL: The Language and Its Usage
Meyers, G. J.	Software Reliability
Finkel, Jules	Computer-Aided Experimentation
Clarke, John, et al	Global Simulation Models: A Comparative Study
Gilb, T. & Weinberg, M.	Humanized Input
Andrews, H. & Hunt, B.	Digital Image Restoration
Gilb, T.	Software Metrics
Pollack, B. W.	Compiler Techniques
Enslein, et al, eds.	Statistical Methods for Digital Computers, Vol. 3
O'Muircheartaigh, ed.	Exploring Data Structures, Vol. 1
O'Muircheartaigh, ed.	Model Fitting, Vol. 2
Weinberg, G. M.	An Introduction to General Systems Thinking
Jensen & Wirth	PASCAL User Manual & Report, 2nd ed.
Lucas, H. C. Jr.	Why Information Systems Fail
Reny, Alfred	Dialogues on Mathematics
McCracken, D. D.	A Simplified Guide to Structured COBOL Programming
Ervin, Sam J.	Federal Data Banks and Constitutional Rights, Vols. 1, 3, 4, 5 - Senate hearings, 1974
Ervin, Sam J.	The Collection, Use and Computerization of Personal Data, Parts 1 and 2 - Senate hearings, 1974
Mano, M. Morris	Computer Systems Architecture
Tanenbaum, A. S.	Structured Computer Organization
Jardine, D., ed.	Data Base Management Systems
Zemanek, H., ed.	The Skyline of Information Processing
Raphael, Bertram	The Thinking Computer - Mind Inside Matter
Box and Jenkins	Time Series Analysis Forecasting and Control

Reports

Author	Title
Ross and Brackett	The AED Approach to Building Graphics-Oriented Systems
Feldmann, et al	AED-0 Programmer's Guide
DPMA	Industry Workshop on Information Systems Education
Datz, I. M.	Thesaurus of Computer Software
Brackett, et al	Case Study in Interactive Graphics Programming

Reports

Author	Title
Marshall, Kneale	Dept. of Operations Research Technical Report List
Fraser, A. G.	The Present Status and Future Trends in Computer/ Communication Technology
Feldman, S. I.	MAKE - A Program for Maintaining Computer Programs
Brown, W. S.	A Realistic Model of Floating-Point Computation
Kernighan, et al	The M4 Macro Processor

The Newsletter appears semiquarterly and is written by members of the staff, W. R. Church Computer Center (Code 0141), Naval Postgraduate School, Monterey, California 93940. Requests for further information or suggestions on articles for the Newsletter may be addressed to the User Services Manager, Code 0141 (In-133), X2752 (or X2573 for messages).

The Center provides batch-processing service under IBM 360/Operating System (OS/MVT/HASP, Release 21.8) and time-sharing service under CP-67/CMS, Version 3.2. These services are based on a dual-processor IBM 360 Model 67 system with 2.0 megabytes of core storage.

Distribution

List 3, plus: 1-A5, 125-B2, 3-B3, 1-B13, 3-F3, 1-F4, 1-F5, 1-F6, 60-Student Mail Center (Lobby)